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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,431	12/10/2003	Kenji Kurata	492322015100	5131

25227 7590 10/16/2007

MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 400
MCLEAN, VA 22102

EXAMINER	
CAZAN, LIVIUS RADU	
ART UNIT	PAPER NUMBER
3729	
MAIL DATE	DELIVERY MODE
10/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/731,431	KURATA ET AL.	
	Examiner	Art Unit	
	Livius R. Cazan	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4 and 6-10* is/are pending in the application.

4a) Of the above claim(s) *7-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/18/2007 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1 and 10** are rejected under 35 U.S.C. 102(e) as being anticipated by Yoriki (US6640431 to Yoriki et al.).

Yoriki discloses a component feeding unit (10, Fig. 1), a suction nozzle (90, Fig. 2), a sensor (470, Figs. 19 and 20A-20D; see ln. 56 of col. 38 to ln. 50 of col. 39) measuring a vertical position of a lower end of the suction nozzle either before or after a

vertical movement of the nozzle for mounting or receiving an electronic component (see ln. 60 of col. 29 to ln. 4 of col. 30), and a controller (330, Fig. 14) judging that the suction nozzle is worn when the vertical position of the lower end of the suction nozzle measured by the position sensor is higher than a predetermined position (see col. 39, lns. 29-31).

It should be noted that claim 1 recites "a position sensor measuring a vertical position of a lower end of the suction nozzle". A sensor doesn't actually *measure* the vertical position, but, rather, it produces data that is then interpreted by a controller. It is actually the controller that performs the *measuring*, since the same data can be interpreted to correspond to different physical parameters. The sensor of Yoriki directs light toward the lower end of the nozzle and the reflected light is detected by a CCD sensor. A controller then judges whether the nozzle is missing or worn based on the amount of light reflected back to the CCD sensor, compared to an expected value (). The amount of reflected light is higher for a normal nozzle and smaller for a worn nozzle, i.e. one having a vertical position higher than that of a normal nozzle. Therefore Yoriki discloses the claimed limitations.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 1, 2, 6, and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano (US5539977 to Kano et al.) in view of Yoriki and vice versa.

As discussed in the office action mailed on 3/23/2007, Kano discloses substantially the same invention as the Applicant, including a component feeding unit (7, Fig. 2), a suction nozzle (14, Fig. 4), and a line sensor measuring a vertical position of the lower end of the nozzle (27, Fig. 4; see col. 5, lns. 59-64). Kano also discloses determining a range of vertical movement of the suction nozzle based on the vertical position of the lower end of the suction nozzle measured by the position sensor (see ln. 65 of col. 7 to ln. 3 of col. 8).

However, the line sensor of Kano is located such that the measuring operation takes place after picking up a component, not before the nozzle performs a vertical movement for picking up a component.

Yoriki on the other hand discloses a component mounting apparatus whereby a line sensor images a nozzle for the purpose of detecting a faulty nozzle such as a bent or missing nozzle (see ln. 50 of col. 37 to ln. 56 of col. 38). This operation is performed either before or after a vertical movement for mounting or picking up a component (see ln. 60 of col. 29 to ln. 4 of col. 30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kano/Yoriki, in view of the teachings of Yoriki/Kano to obtain a component mounting apparatus utilizing a line sensor to measure a vertical position of a nozzle as claimed, this measuring being performed not only before a vertical movement for mounting a component, but also before a vertical movement for picking up a component. One of ordinary skill in the art would have been motivated to do so because problems with a suction nozzle can

appear at any point during the mounting cycle, not necessarily only after picking up a component but prior to placing the component on a substrate, and thus it would be obvious to add sensors that can detect a fault at other times as well, such as after mounting a component but prior to picking up the next component.

7. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kano and Yoriki in view of Takeuchi (US5661239).

Kano and Yoriki disclose the same invention as the Applicant, except for a decision device judging that the suction nozzle is about to fall when the vertical position of the lower end of the suction nozzle measured by the position sensor is lower than a predetermined position.

Takeuchi teaches a judging device (se col. 7, lns. 55-60; clearly a decision device exists, since the apparatus is stopped due to the detection of a low nozzle) which judges that a suction nozzle is about to fall when the vertical position of the lower end of the suction nozzle is lower than a predetermined position. Takeuchi also teaches an optical sensor could be utilized (see col. 8, lns. 10-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kano and Yoriki, in view of the teachings of Takeuchi, providing it with a judging device which utilizes the output of the position sensor to judge a suction nozzle is about to fall if its lower end is lower than a predetermined position. One of ordinary skill in the art would have been motivated to do so since the sensor of Kano and Yoriki already tracks the lower end of the nozzle and therefore no new sensors would be required. A system thus implemented would allow

the apparatus to detect a nozzle that is about to fall, in order to prevent improper operation.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 2, 4, and 6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Livius R. Cazan whose telephone number is (571) 272-8032. The examiner can normally be reached on 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571)272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LRC 11/13/2007

PETER VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700